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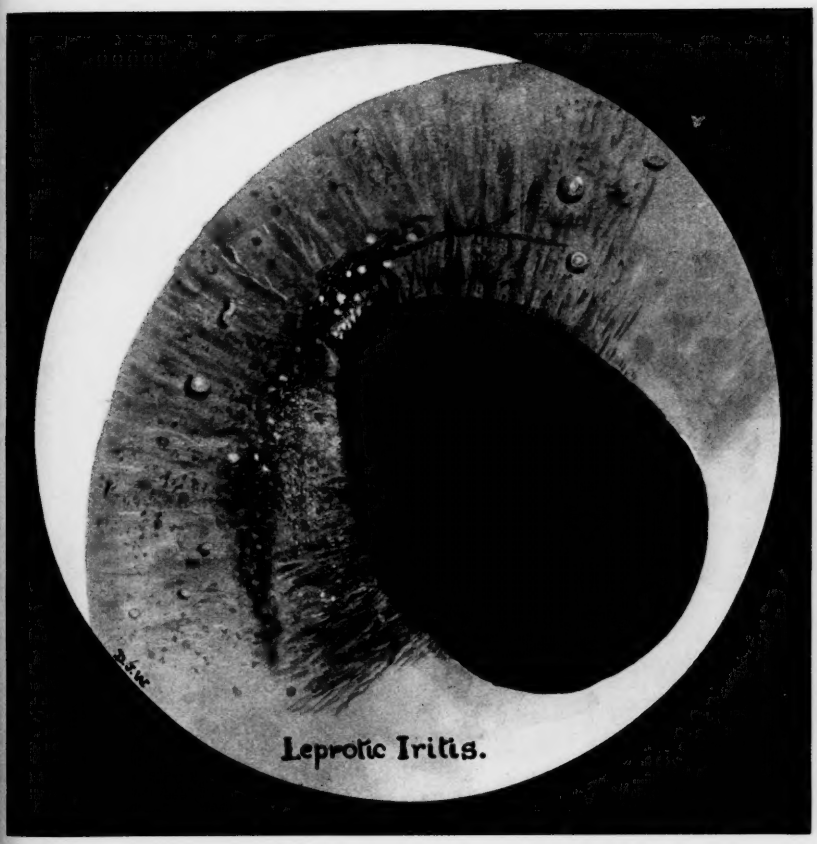

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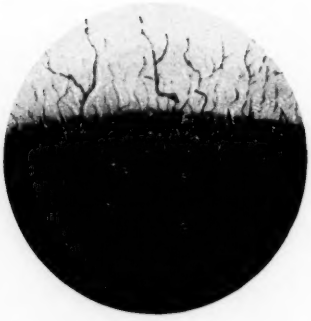
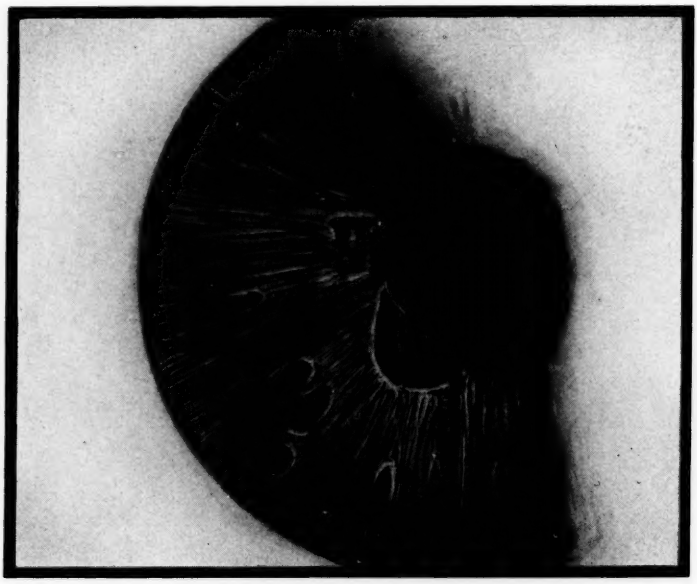


Leprotic Infiltration of Cornea.

To illustrate D. J. Wood's paper on "Ocular Leprosy."



To illustrate M. S. Mayou's paper on
"Chronic Irido-Cyclitis: Atrophic Patches in the Iris."

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COMMUNICATIONS

OCULAR LEPROSY

BY
D. J. WOOD
CAPE TOWN

ONE of the greatest tragedies in the life of the unfortunates who contract leprosy is the affection of sight which occurs in some form or other in nearly all cases if they live long enough. As is well known the anaesthetic cases suffer from desiccation of their exposed corneae, and get ulcers and opacities. Efficient protection goes some way to prevent this, but in the tuberculous cases the eyes themselves are attacked by the disease and blindness follows.

Though there may be often found pericorneal deposits leading to opacity of the cornea, the great cause of loss of sight is irido-cyclitis, and I do not think that any cases show signs of ocular affection in any way until this has made its appearance. The condition begins very insidiously and is well developed before acute attacks are felt, and progress is invariable, going on to occlusion of the pupil, opacity of the cornea, lens and vitreous, with shrinking of the eyeball. It is now many years since I discovered that the statement that lepromata did not occur in the iris was incorrect. They are merely very small, but can be seen as yellow points lying on the iris in every case of irido-cyclitis. They are indeed pathognomonic, no other eye condition resembling them in the least. Any efficient loupe will show them. I also learned long ago that the iris texture is rotten so that iridectomy fails. The forceps removes only so much as is between the teeth, and the pigment layer remains on

the lens. Atrophy is always a component of the disease, and however much the iris is adherent glaucoma never results.

The slit-lamp and binocular microscope have thrown a flood of light on the condition, and though I have been able to see only such cases as were sufficiently presentable to permit of their leaving Robben Island I have learned many new facts.

I have had under observation and treatment a young Jew, aet. about 21, who acquired leprosy in an unknown way when about 11. His right eye was excised some six months ago and sent to the laboratory of the Royal London Ophthalmic Hospital. The left is the subject of the illustration. In this, as in other cases, the feature which strikes one first is the discrepancy between the naked eye, or low power magnification, and the appearances under a high power. Formerly one could see pupillary distortions and adhesions, atrophy of the iris as evidenced by fading, and loss of pattern; but with the binocular microscope and slit-lamp one can see profound changes such as are imperfectly shown in the illustration, or more complete destruction of the tissue so that no stroma, sphincter or uveal tissue can be recognized in the neighbourhood of the pupil, there being merely an inflammatory membrane which ends in a shrunken opaque lens with hardly a visible boundary.

One may see in syphilitic cases nodules in or on the iris, not much different in size from those shown in the present case, but whereas these disappear with treatment and their former site can afterwards be detected only because a slight thinning in the iris stroma can be seen with the slit-lamp and neighbourhood illumination, in leprosy infiltration of the tissue and its destruction are nearly coextensive.

The iris and ciliary muscles are early affected in leprosy. The pupil is sluggish or inactive, and there is a premature presbyopia even where distant vision keeps good. The pupil may be distorted either by adhesions or as in the present case by cicatricial changes.

The drawing which I have made illustrates an early case of leprotic iritis. The pupil is immobile and the edge is drawn towards the periphery by contraction in the iris substance. The uveal edge is everted in this region. There is only one actual adhesion of the pupillary border visible, very different from what happens in ordinary iritis. On the surface of the iris may be seen rounded nodules raised above the surface so as to cast definite shadows. They are pink with a dense white centre. Smaller than these, and not visible with a loupe, are similar nodules going down in size to particles hardly visible separately. On the inner side and above there is a fold ending as a depression which is full of deposits, those on the surface being so massed as to resemble a growth of mould. Anywhere in the iris one can see darker depressed spots where one may presume leprotic nodules have been absorbed.

The stroma pattern of the iris is represented by white lines in a porous crumbly-looking tissue. There are no crypts. No blood vessels are visible, but in other cases, where atrophy is greater, the radial vessels of the iris may become exposed.

The aqueous is full of circulating cells showing that inflammatory changes are in progress, but there are no stellate or circular pigment deposits on the lens such as are seen in ordinary iritis after a single attack. The cornea shows in its upper part large numbers of white spots which begin as white peri-vascular lines at the limbus. The spots are composed of tiny discrete points coalescing into groups, and they may be seen at varying depths in the corneal tissue, but always as thin flat laminae among the corneal fibres. They diminish as one passes inward and end as tiny isolated points. Some may be close to Descemet's membrane, but it is difficult to be sure as reflections are deceptive.

True precipitates on the back of the cornea do not occur in leprosy. If they exist in a leper, it is in cases where the iritis is due to other septic causes, such as bad teeth, etc. In old cases there may be opacities on or in Descemet's membrane, but they have neither the appearance nor the distribution of keratitis punctata. The vitreous is clear and vision is good in this case.

Until the present case I have never seen ocular leprosy where iritis had occurred, and where there was an episcleral lepromatous thickening, which did not continue to get worse continuously, and at an appreciable rate. I obtained permission for this patient to come to the mainland once weekly, in order to try the effect of subconjunctival injections, and I began with bicyanide of mercury in saline. This did not seem to produce any effect. Casting about for something which might increase the vulnerability of the bacilli, I added to my solution some purified ox gall which mixes without precipitate, and found that almost from the start improvement began.

As I was not then in possession of a slit-lamp, I do not know what differences may have existed in the iris, but all the considerable leprous thickening round the cornea has disappeared, and the eye appears quite normal except for the distorted pupil. I speak of the appearance to naked eye of course. Such an improvement I have never formerly observed, and the patient is convinced of the value of the treatment. Latterly I have obtained pure sodium taurocholate and have used this in a one per cent. strength added to bicyanide one in two thousand five hundred, in two per cent. saline. The pain is slight and there is little reaction. That the improvement is not due merely to a general improvement is suggested by the fact that, whereas the patient was supposed to be a nearly arrested case, he has had during the treatment a severe general relapse affecting arms and legs, and the right eye was removed for pain.

I am aware that in a so slowly progressing disease as leprosy, a

year is not a sufficient time on which to build more than hopes. yet a cessation of the iritis, and a disappearance of the more superficial ocular disease makes one feel that the hopes have some good foundation.

HYDATID CYSTS OF THE ORBIT

BY

D. J. WOOD

CAPE TOWN

HYDATID cysts of the orbit are not uncommon in South Africa, and from first to last I have seen a large number of them. It is a possibility to be remembered in all cases of proptosis, and, so far as I know, little is on record to help the operator who finds himself confronted with such a case. In the last three years I have had three cases which have been instructive by reason of the errors made, and it may save others from making similar errors if I relate them.

Hydatid cysts in the orbit fall into two classes according to their position, those which are within the muscle cone and those which are without. The difference is a very practical one, since if the cyst is within the muscle cone, or at the apex of the orbit, the eye will become blind, whereas if it is lateral to the eyeball it probably will not. Moreover, in the latter position operation is comparatively easy, while in the former case it is difficult. Diagnosis is very uncertain short of aspiration, but the negative Wassermann, the absence of inflammation, and of a palpable tumour in most cases, are suggestive if the patient lives in a land where hydatid disease occurs.

The first case came in October, 1920, a coloured girl, P. Japhtha, aged sixteen. There was proptosis of the left eye which had been increasing, with pain, during a month. Vision was six-ninths. No tumour could be felt, but the eye resisted backward pressure. There was no fundus change. I suspected a tumour. Her blood was taken for a Wassermann test, and she was told to return in a week. The test was negative, but the girl did not return till April, 1921. The eye was then pushed forwards almost to the point of dislocation. It had been quite blind for four months, but the cornea was clear enough to allow the fundus to be still seen, and it was apparently normal. Slight neuritis is not uncommon in orbital hydatids.

No tumour was palpable anywhere, despite the prominence. There was no disease elsewhere. Movements were present but restricted. Under an anaesthetic I explored the orbit, and deeply

in the apex I tapped a cyst whose clear contents were under pressure, and pushed up the piston of the syringe. An incision was made at the outer upper orbital angle and a slow dissection made backwards. The orbital fat was a great nuisance, only partly controlled by a bi-valve nasal speculum. The muscles were hardly recognizable, and I divided the superior rectus, stretched out into a membrane, before I recognized it. The white cyst was at last reached in the orbital apex and was removed, piecemeal at first, and the remainder in one pretty big fragment, measuring about an inch by half an inch when floated out in water. The typical cyst wall, like white of egg hard boiled, cannot be mistaken for anything else. As in all the cysts I have seen it was sterile—no daughter cysts.

Much oedema followed but did not last long. The result was surprising. On the third day patient was able to see light, in two weeks she had 6/5, and in three weeks most of 6/4; almost too good for belief. There was some ptosis and loss of upward movement but less than I expected. The result was therefore unexpectedly good.

The second case was seen in February, 1922. A child of three was brought to hospital with the left eye greatly proptosed, the cornea ulcerated from exposure, and practically destroyed. My diagnosis was "probably glioma." Operation, however, showed immediately that the eye was not adherent behind, and it was removed with ease. When bleeding had lessened, I caught a glimpse of a dark blue cystic looking body in the orbit, but I failed to palpate anything or to see it again. The next day I was informed that the child had a high temperature and was delirious, and I began to think of a ruptured encephalocele. Two days later the temperature went down, and before the end of the week two ruptured clear-walled hydatid cysts were discharged from the orbit. The thick white cyst wall was absent, and they resembled daughter cysts except that there were no traces of heads or suckers.

In December of 1923, I saw the third case, a white woman of 25, Mrs. Roux, who came to the hospital with great prominence of the right eye. Pain in the orbit dated back a year, and proptosis nearly as long. Sight failed from the outer side, and for six months the eye had been wholly blind. No tumour could be felt. Wassermann test was negative. There was no fundus change. I thought first of hydatid, but very unwisely made an exploratory puncture, before I had arranged for special instruments. Hydatid fluid was found deep in the orbit, and remembering my former difficulties I decided to wait. This proved impossible, as by the next day there was intense oedema of the whole orbit with fixation of the eye, and suggestion of early suppuration. Under an anaesthetic I incised at the upper outer angle of the orbit, and dissected down, but owing to the great oedema progress was very slow, and it was

practically impossible to tell what tissues one was dealing with. As before, the worst trouble was due to the orbital fat, but haemorrhage was also very annoying. The cyst was reached deep in the orbital apex and was removed, first in small pieces and ultimately as a good-sized fragment about an inch by three quarters, but very irregular.

Recovery was very good, and six days after the operation patient could see hand movement. It was, however, only too clear that her right sixth nerve had been damaged, as she had a bad and increasing convergent squint. Before she left hospital she had six sixtieths of vision, and having lost her pain she did not mind the squint.

There are several lessons which I have had to learn in these cases. One must have everything ready for the completion of the operation when one starts to explore the orbit. In my third case I removed nearly 3 c.c. of fluid, in spite of which there must have been a large leak of irritating material into the orbit so that the operation was seriously complicated by the intense reaction.

The second point is that one must have an efficient light. The operation has to be done down in a narrow hole close to important structures, and a small light which will neither shine in the eyes, nor obstruct the vision is essential. I propose to get a reflector made to fit over the end of my Graves' corneal illuminator, so that the tube of the latter may lie flat on the surface and throw the light just over the edge of the hole. A mirror or head light might be better.

An efficient speculum is necessary to dam back the orbital fat. One will have to remove much of this, but a good long bi-valve speculum would save a lot. Another point is that when one has to work in a small deep cavity one's hands get in the way of one's vision, and angled scissors and forceps are a great help.

The most interesting point of these cases is the extraordinary capacity for recovery of vision after long periods of blindness. I know of three cases where this occurred in eyes blind for many months, though none approached in recovery the first case I have mentioned. The capacity to recover is important, as, where an eye has been blind for months, there might be a temptation to excise it in order to obtain easy access to the orbit.

It would seem that if the visual failure in glaucoma is attributable to the stretching of nerve fibres at the disc margin, a different sort of damage occurs from what happens in these cases of hydatid, since the former is incapable of recovery while the latter is not.

In all of the cases the other eye was unaffected and vision and fields of vision were good.

The early recovery of vision points to the absence of degenerative changes in the nerves which was in agreement with the absence of fundus changes.

CHRONIC IRIDO-CYCLITIS: ATROPHIC PATCHES IN THE IRIS

BY

M. S. MAYOU

LONDON

EVERY ophthalmic surgeon is familiar with cases of patches of inflammation followed by atrophy in the choroid associated with keratitis punctata. These were first pointed out by Hill Griffith.[1] Textbooks do not point out that patches of atrophy also occur in the iris associated with chronic irido-cyclitis, although they are frequently to be found if carefully looked for in these cases.[2] The common situation is usually either at the greater or lesser circle of the iris and rarely, as in the following case, at the margin of the iris. In other words they occur where the capillary anastomosis is largest. They are not usually observed during the first onset of the disease, but make their appearance generally from 3 to 6 weeks after the onset. It is possible that they are not observed in the early stages of the disease owing to the use of atropin to dilate the pupil. They are probably the site of the embolic infection causing the disease. The following are the notes of the case from which the illustration was made.

Mrs. B., aged 55 years, first seen on September 19, 1924, complaining of mist before the right eye, which came on suddenly a week previously. There was no ciliary injection. The pupil dilated evenly with atropin. There were keratic precipitates and vitreous opacities. Her teeth showed marked pyorrhoea alveolaris, and there were several apical abscesses. The teeth were extracted and a vaccine given. On October 8 she developed atropin irritation, and the atropin was left off. On October 22 the pupil had regained its activity, and the atropic patch at the margin of the iris could then be seen.

REFERENCES

1. **Hill Griffith.**—*Trans. Ophthal. Soc.*, Vol. VII. p. 134.
2. **Mayou.**—*Brit. Med. Jl.*, Oct. 28, p. 1324, 1910.

PRESCRIBING SPECTACLES (2)

ALTERATION OF THE POWER OF A CYLINDER WHEN USED FOR CLOSE WORK

BY

A. S. PERCIVAL

NEWCASTLE-UPON-TYNE

AFTER correcting a high degree of astigmatism and obtaining a macular visual acuteness of 6/6, or at any rate some of the letters of that line, I have often been disappointed with the result I obtained when testing the patient's near vision. I could not understand it, and five months ago I determined to see if the effective value of the cylinder was altered when used for close work. To my surprise and to my delight I found that this was so, and my difficulty is thereby explained; on increasing the power of the cylinder appropriately I have now obtained better visual results at reading distance.

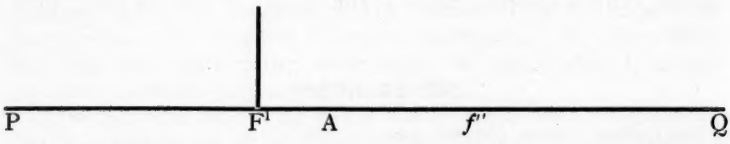
Far Vision.—Parallel rays incident on a convex lens at F^1 (the anterior focal plane of the eye) come to a focus at f'', the focal distance being $f''\ F^1$. The focal distance of the equivalent contact lens placed at A (the cornea) will be $f''\ A$ or $f''\ F^1 + F^1 A$.

If the lens at F^1 be of power D, and that at A be of power D_1,

$$D^1 = \frac{-1}{f''\ F^1 + F^1 A} = \frac{-1}{\frac{-1}{D} + l} = \frac{D}{1 - l D} \quad \ldots\ldots (1)$$

where l or $F^1 A = \cdot 01375$m.

I use Tscherning's constants for the eye which I find are far more accurate for British eyes than Gullstrand's.



Near Vision.—Suppose that the object viewed (P) be at the distance p from the plane of the spectacles, so that $p = PF^1$; the image of P is formed at a distance QF^1 or q from F^1, and we have

$$q = \frac{pf''}{p - f''} = \frac{-\frac{p}{D}}{p - \frac{1}{D}} = \frac{p}{1 - pD}$$

If now D_1 be the equivalent contact lens placed at A, and $p_1 = p + l$, or $PF^1 + F^1A$, and $q_1 = q + l$ or $QF^1 + F^1A$, we have

$$D_1 \text{ or } \frac{1}{f} = \frac{1}{p_1} - \frac{1}{q_1} = \frac{q_1 - p_1}{p_1 q_1} = \frac{(q+l) - (p+l)}{(p+l)\ (q+l)} = \frac{q-p}{(p+l)\ (q+l)}$$

Denote $p+l$ by a; in the following tables I have taken p to be 30 cm. and so a is ·31375 m.

$$D_1 = \frac{q-p}{a\ (q+l)} = \frac{\dfrac{p-p+p^2 D}{1-p D}}{\dfrac{ap + al - alpD}{1-p D}} = \frac{p^2 D}{a\ (p+l) - alpD}$$

$$\therefore D_1 = \frac{p^2 D}{a^2 - alpD} = \frac{p^2}{\dfrac{a^2}{D} - alp} \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

From these two formulae the values of D^1 and D_1 can be readily determined, as given below for four different powers of both convex and concave lenses; of which use will be made hereafter.

	D^1	D_1		D^1	D_1
+ 4	+ 4.2328	+ 3.8601	− 4	− 3.7915	− 3.4744
+ 7	+ 7.7455	+ 7.0486	− 7	− 6.3854	− 5 8605
+ 9	+10.2710	+ 9.3323	− 9	− 8.0089	− 7.3578
+12	+14.3713	+13.0264	−12	−10.3004	− 9.4762

When we are dealing with distant vision it will be seen from the values of D^1 that convex lenses in the usual place (F^1) have the same effect as stronger lenses in contact with the cornea, in fact a + 4 D cylinder corrects a corneal astigmatism of nearly + 4.25D of astigmatism; but concave lenses are equivalent to weaker corneal contact lenses If, however, we are considering convex lenses used for near vision (D_1) we find that a curious change takes place, in this instance when the distance of F^1 from the object (p) is 30cm., cylinders below +7D correct a corneal astigmatism of less than its nominal value, but cylinders above +7D correct a higher degree of corneal astigmatism. I will not now give the mathematical explanation of this fact.

The important point to notice is that in every case D_1 is less than the corresponding D^1, and as the corneal astigmatism is always determined, whether by retinoscopy or by test types, for distant vision, it is obvious that in simple astigmatism if of high degree a stronger cylinder will be required for reading. If − 5D cyl.

is required for distance, a − 5.5D cyl. will be needed to correct this astigmatism for reading. If + 4D cyl. is the accurate correction for distance the corneal astigmatism is D^1 or 4.2328, and we must find what lens placed at F^1 will correct this amount of astigmatism when near objects are being viewed. In other words what lens will give D_1 the value of D^1.

We have $D_1 (a^2 - alp\,D) = p^2\,D$ . . . . . (a)

$$\therefore \quad (a^2 - alp\,D) = \frac{p^2\,D}{D_1}$$

But the corneal astigmatism is D^1 not D_1, and $D^1 = \dfrac{D_0}{1 - l\,D_0}$

where D_0 represents the original cylinder (say + 4D) which placed at F^1 corrected the astigmatism in distant vision.

$$\therefore \quad a^2 - alp\,D = \frac{p^2\,D}{D^1} = \frac{p^2\,D}{D_0} - p^2\,l\,D$$

$$\therefore \quad D\left(\frac{p^2}{D_0} + pl\,\overline{a-p}\right) \text{ or } D\left(\frac{p^2}{D_0} + pl^2\right) = a^2$$

$$\therefore \quad D = \frac{a^2}{\dfrac{p^2}{D_0} + pl^2} \quad . . . . . (3)$$

This is the general formula which is universally true, and gives correct results for convex or concave lenses according to the sign given to D_0.

The table at the end gives the results to four decimal places when p = 30cm. or 0.3m., l = 0.01375m., a = 0.31375m.

For the convenience of any one who cares to check my results I give the following values:

$a^2 = 0.09843906$ $\quad pl^2 = 0.00005671875$
$alp = 0.00129422$ $\quad p^2 = 0.09$

The table is interesting in several ways. For instance, we have all noticed that aphakic patients who are lucky enough to see with + 11 D the 6/9 line, prefer + 15 D for reading at 1/3 m. and not + 14 D; it is clearly simply an optical affair, the + 15 D when used for reading has only the effectivity of + 14 D. Suppose that the best correction for a conical cornea is − 9 D cyl. for distance, then − 10 D cyl. will be the best cylindrical correction for reading.

It will naturally be supposed that sphero-cylinders will require a similar modification, but this is not so always. When testing a patient's refraction, we test it for distance, and then find by trial what additional spherical lens must be given to compensate for his presbyopia. Now if a full correction of + 3 D is added for his presbyopia when reading at 1/3 m., it will be found that the table

gives quite erroneous results. In such a case + 3 D of the correction merely forms an image at a distance of the object (at 1/3 m. distance). Hence no modification in the cylinder will be necessary, for the cylinder already found by trial that corrects the astigmatism for distance will still correct the error for reading. But when no presbyopic addition is made, the table will be a useful guide to the alteration required. As a rough approximation one may say that if the cylinder that is found to correct the astigmatism at a distance be + 5 D :—

When the same spherical correction is used for near work the cylinder must be increased to + 5.45 D or say + 5.5 D.

When + 1 D is added to the spherical lens for near work, 2/3 of 0.45 should be added to the cylindrical lens theoretically, that is the cylindrical correction should be + 5.3 D.

When + 2 D is added to the spherical lens for near, 1/3 of + 0.45 D should be added to the cylindrical lens, or the cylindrical correction should be + 5.15 D.

When + 3 D is given for presbyopia, no addition to the cylindrical lens should be made, or + 5 D cyl. will be correct.

It will be well to work through an example in detail to show the correct procedure. Suppose + 4 D sph. ⊃ + 5 D cyl. is the accurate correction for distance; in one plane + 4 D is required and $D^1 = +\ 4.2328$, in the other plane + 9 D is required and $D^1 = +\ 10.2710$.

The actual corneal astigmatism is + 6.0382, the difference between the two values of D^1. This corneal astigmatism is fixed and must be corrected for near work. Suppose first that no presbyopic addition is needed for reading. The effective value of + 4D at the cornea (D_1) when the object is 0.3m. from F^1, is + 3.8601. This added to the corneal astigmatism is + 9.8983. We must now find what lens placed at F^1 will have this effective value at the cornea. Now on p. 10 from (*a*) it may be seen that

$$D = \frac{a^2}{\frac{p^2}{D^1} + alp}. \qquad \text{As } \frac{p^2}{D_1} = \frac{0.09}{9.8983} = 0.00909247$$

$$\text{and } alp = \frac{0.00129422}{0.01038669}$$

$$\therefore\ D = \frac{0.09843906}{0.01038669} = 9{\cdot}4774$$

Consequently the sphero-cylinder should have a power of + 4 D in one plane, and + 9.4774 in the other plane, *i.e.* practically + 4 D sph. ⊃ + 5.5 D cyl.

If a similar calculation be made for + 7 D sph. ⊃ + 5 D cyl., *i.e.* the accurate correction for distance, it will be found that if the

same spherical lens be used for work at 30 cm. the cylinder that will accurately correct the astigmatism for this distance will be + 5.499 D, or practically + 5.5 D again. If the case of −7 D sph. ⊂ − 5 D cyl. be worked out in the same way, the cylinder required for near work will be found to be − 5.44 D instead of the previous − 5 D.

We will take this last case −7D sph. ⊂ −5D cyl., when a presbyopic addition of +3D is needed for work at 30cm.

For distance in one plane −7D is required where $D^1 = -6.3854$
in the other plane −12D . . . . . where $D^1 = -10.3004$

The corneal astigmatism is therefore −3.915, this added to the D_1 value of −4D or −3.4744 is −7.3894, and it is found that

$$\text{as } \frac{p^2}{D_1} = \frac{0.09}{-7.3894} = -0.01217961$$

$$\text{and } alp = \frac{0.00129422}{-0.01088539}$$

$$\therefore \quad D = \frac{0.09843906}{-0.01088539} = -9.0432$$

The prescription −4D sph. ⊂ −5D cyl. can therefore be given with confidence for near work, as the 0.0432 is negligible. Indeed this small decimal fraction only arises because I have taken 30cm. as a more usual distance for reading than the orthodox 33⅓cm. If this distance (⅓m.) had been taken, the +3D addition would have compensated for it exactly.

It will be seen that the value given in the table for +5D will indicate sufficiently closely the value of the cylinder required for near work when no presbyopic addition to the spherical component is made. The table was drawn up for a different purpose—to show the lenses which must be used for close work, if exactly the same ametropic correction is required as that for distance. Thus from the table + 7.6227 D, when used for work 30 cm. away, corrects the same amount of hypermetropia as + 7 D corrects at distance, and +7.6227 D ⊂ + 5.404 D cyl. is equivalent to +7 D sph. +5 D cyl. at a distance. But although + 7 D sph. + 5.499 D cyl. when used for close work corrects + 5 D of astigmatism, it does not fully correct the + 7 D of hypermetropia.

The alteration in the spherical component given in the table may be neglected, but it will be seen that if mathematical accuracy is required a troublesome calculation is necessary. However for practical purposes any spherical addition can be found by trial, and it must be remembered that the length of the patient's arms has a good deal to do with the most comfortable distance for holding a book.

In the absence of a table it will be found that about 9 per cent. of the power of the lens required for distance must be added to

produce the same effectivity when used for close work, provided that no addition is made to the spherical component. Thus 0.45 must be added to a + 5D cyl. when used for work at 30cm. Hence if +1D is added for presbyopia the cylinder should be increased by about 6 per cent., if +2D is added, by about 3 per cent., and if +3D is added no increase of the cylinder is necessary.

There is one other point I may mention about reading glasses. When the eyes are converged and depressed, the superior obliques must play a very important part in the depression, and with this there may be a variable amount of intorsion depending upon the actual insertion of these muscles. If intorsion occurs the axes of the cylinders should be intorted also. Occasionally I have found that a slight intorsion of high cylinders results in better and more comfortable vision of near objects.

Distance.	30 cm. from F^1.	Distance.	30 cm. from F_1.
+ 1	+ 1.0031	− 1	− 1.0945
+ 2	+ 2.1848	− 2	− 2.1903
+ 3	+ 3.2751	− 3	− 3.2875
+ 4	+ 4.3641	− 4	− 4.3861
+ 5	+ 5.4517	− 5	− 5.4861
+ 6	+ 6.5379	− 6	− 6.5875
+ 7	+ 7.6227	− 7	− 7.6903
+ 8	+ 8.7062	− 8	− 8.7945
+ 9	+ 9.7884	− 9	− 9.9001
+ 10	+ 10.8692	− 10	− 11.0070
+ 11	+ 11.9486	− 11	− 12.1154
+ 12	+ 13.0267	− 12	− 13.2252
+ 13	+ 14.1034	− 13	− 14.3364
+ 14	+ 15.1788	− 14	− 15.4491
+ 15	+ 16.2529	− 15	− 16.5631
+ 16	+ 17.3256	− 16	− 17.6785

This table gives in the second and fourth columns the lenses that should be used for close work, if exactly the same correction is required as that for distance in the first and third columns.

EPITHELIAL DYSTROPHY OF THE CORNEA

BY

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UNDER the name Dystrophia Epithelialis Corneae, Fuchs[1] has described a clinical condition characterized as follows: (1) The disease attacks elderly persons and is slowly progressive; (2) no inflammatory symptoms accompany the progress of the lesion; (3) there is a diffuse opacity of the cornea, most intense in the central region, shading off to a clear zone near the margin; (4) the corneal epithelium is roughened, deficient in lustre, and contains numerous vesicle-like elevations.

In recent years with the aid of the corneal microscope a group of cases presenting quite a different picture has been described by Vogt[13] and his pupil, Moeschler[14], in which small dew-drop-like elevations were observed on the posterior surface of the cornea. In the November, 1924, issue of this journal, Basil Graves[15] has published an extensive study of these changes. They consist essentially in the presence, just under the corneal endothelium, of minute clear deposits which result in slight dome-like elevations of the endothelium. When seen in smallest number they occur only in the central part of the cornea. Sometimes, however, these elevations are scattered over almost the whole posterior surface of the cornea and in some such cases he has noted the transient appearance of vacuoles in the corneal epithelium. Mr. Graves mentioned the possibility of a relation between the condition which he describes and the epithelial dystrophy of Fuchs, but had not had the opportunity to confirm this view.

In the past few years we have had under our observation five cases showing these endothelial changes. We have been able also to study three cases of typical epithelial dystrophy. All three of these cases showed, in addition to the epithelial change, extensive alterations of the endothelial surface of the cornea, similar to those described by Mr. Graves and observed by us in the other cases.

GROUP I.

Cases showing changes in the endothelial layer of the cornea, but no alteration of the epithelium

Mr. Graves has described the changes in the inner layers of the cornea in such thorough manner that there is no need for us to give in detail the appearance of those cases in which endothelial changes alone were present. The following table summarizes our findings:

Case.	Age.	Sex.	General health.	Vision.	Type of corneal lesion, classification according to Graves.	Other ocular findings.
121A	42	F.	Approaching menopause. Hypertension(156/90). Oral sepsis	R 20/15	No lesion	None
				L 20/19	III.—A. At first no pigment. Six months later a few fine pigment granules near centre of cornea. Epithelium perfectly normal.	Few granules of pigment on anterior surface of lens. Few very fine opacities in anterior part of the vitreous
1416A	77	F.	Generalized arteriosclerosis	R 20/38	III.—A. Very few pigment granules near centre	Marked arcus senilis. Slight sclerosis of lens nucleus; slight rise in intraocular tension five years ago, controlled by miotics
				L 20/60	III.—A. More pigment	Marked arcus senilis. Moderate sclerosis of lens nucleus; slight rise in intraocular tension six years ago, controlled by iridectomy
67382	42	F.	Obesity	R 20/30	III.—B. No pigment.	Neg.
				L 20/30	III.—B. No pigment	Neg.
2332A	61	F.	History of thyroid enlargement. Slightly elevated blood pressure	R 20/15	III.—A. No pigment	Neg.
				L 20/19	III.—A. No pigment	Neg.
29279	55	F.	High blood pressure	R 20/24	III.—A. Few pigment granules	Neg.
				L 20/24	III.—A. More pigment	Neg.

Comment on Group I

To summarize the above table, we have noted the condition described in five cases, all women over forty. No general or local disease seemed specifically related to the picture. Two of these cases have been followed for over three years, during which time no change could be observed. It is interesting to note that one of the cases, the last in the above table, was first seen eight years ago, before the use of the slit-lamp corneal microscope. At that time a fine granular haze in the anterior portion of the eyes was noted, but it was not possible definitely to localize this haze.

Group II.—Cases of dystrophia epithelialis corneae

Case 1. Miss E., No. 20372, aged 72 years, has always enjoyed good health. She was first seen 18 years ago, at which time she complained of eye strain. With correcting glasses her vision was perfect in each eye and no lesions were found. She was seen at intervals of two or three years and no changes noted until 1916, ten years after the first examination, when her vision had become slightly blurred (from 20/15 it became 20/19), and a fine dusty opacity was noted which could be seen only with the ophthalmoscope with high plus lenses and was thought to be located in the lens. Subsequent observations make it seem likely that this haze was corneal and not lenticular. General physical examination at that time was negative.

During the next two years the condition was practically stationary, but a year later, in 1919, she complained of occasional stinging pain in her eyes. Her vision was now 20/30 in each eye, and there was easily visible a diffuse haze of the lower half of each cornea. The corneal surface was roughened, and small blebs were present under the epithelium. Since that time the vision has fluctuated slightly, the corneal haze has become much more dense, but has not extended very much farther. There is no loss of sensibility of the cornea. The treatment has consisted of occasional courses of dionin.

Since 1922 this case has been repeatedly studied with the corneal microscope. The area of densest haze extends from slightly above the centre of the cornea almost to the lower limbus. Over this area the epithelium is roughened, lacking in lustre and considerably thickened. It has lost much of its normal transparency. Here and there it is elevated over small irregular accumulations of clear fluid. These blebs at times reach 0.5 mm. in diameter, but for the most part they are much smaller. Occasionally one sees a small crater-like depression in the epithelium suggesting that here one of the blebs has burst. The stroma beneath the affected epithelium is somewhat thickened and shows a diffuse haze most intense in the superficial layers. Roughly about one-half the total opacity of the cornea here may be laid to the epithelial change, half to the change in the stroma. The deepest layers of the cornea cannot be clearly seen in this region, but certainly they contain no considerable accumulations of pigment and no very dense opacities.

Near the border of the dense epithelial opacity it is possible, by looking obliquely through the cornea beneath the affected epithelium, to get a fairly good view of the deeper layers. The endothelial surface here is seen to be thrown into innumerable minute irregular confluent elevations such as Mr. Graves has described in his type III-B. On direct illumination one sees here great numbers of tiny golden yellow straight and curved lines

suggesting pigment deposits, but on retro-illumination only a few scattered pigment granules can be seen. This area of great irregularity in the endothelial surface has a fairly sharp border, corresponding more or less to the border of the epithelial change, but beyond this and extending nearly to the limbus the endothelium is closely studded with minute dew-drop-like elevations. In the clear part of the stroma the corneal nerves can be well seen but do not appear abnormal. The iris and lens show no abnormality. Visual fields and intraocular tension are normal. The patient's general health remains excellent.

Case 2. Mr. T, No. 488-A, aged 58 years, has always enjoyed good health. He was first seen a year and a half ago when he complained that the vision of his right eye was sometimes blurred, especially in the morning. Vision, with proper correction: R.E.=20/38; L.E.=20/15. There is a diffuse opacity occupying the lower two-thirds of the right cornea, not quite reaching the limbus. The epithelium and stroma in this region show quite the same changes as those described in Case 1. The endothelial surface, so far as it can be seen, is studded with minute clear dew-drop elevations, but is in addition thrown into numerous coarser vertical folds or corrugations.

The left cornea shows *no epithelial* lesions even on careful examination. The stroma appears quite normal. The endothelial surface presents a picture identical with that in the right eye; only one tiny dot of pigment was found in this cornea.

Both eyes showed only slight arcus senilis. The capillaries of the conjunctiva and the corneal nerves did not appear abnormal. The iris, lens, and fundus of each eye, so far as they could be seen were quite normal. Visual fields normal.

The patient was subjected to a careful general physical examination which revealed nothing of significance. There were a few abscessed teeth, which were removed, and slight gastric hyperacidity. During the summer of 1924, the patient suffered from a series of boils and styes and was treated with autogenous vaccine. The patient has been under observation at frequent intervals for a year and a half during which time there seems to have been little change in his condition.

Case 3. Mrs. W., No. 63122, aged 67 years, had always enjoyed good health until within the last few years. In 1919 she suffered with headaches and nervousness due to hyperthyroidism and in 1920 her thyroid was partially removed. In 1922, after several attacks of gallstone colic, her gall-bladder and many gallstones were removed. The urine has a trace of albumen and a few hyalin casts; no sugar. She first came under observation in 1920, when she complained of a blur before her eyes. With correction of her quite considerable astigmatism the central vision was very good

in each eye (20/19), but the ophthalmoscopic picture was found to be slightly blurred due to a fine dust-like haze in both corneae. This haze was not located in the epithelium which was noted to be smooth and glistening. There has been some fluctuation in the patient's condition since that time, but on the whole a steady slow increase of the corneal trouble and a decrease in the visual acuity which, at the last examination in October, 1924, was 20/38.

The patient was first examined with the corneal microscope in 1922, when it was noted that the epithelium of the right cornea was slightly roughened and hazy in the central area. In the epithelium of the left cornea no lesion could be found. The inner surface of both corneae, however, was closely studded with small rounded elevations.

In June, 1924, there was seen a diffuse haze in the epithelium of the central areas of both corneae, with small accumulations of fluid under the epithelium and the complete picture of epithelial dystrophy. The endothelium has in the meanwhile remained unchanged. The iris, lens, fundus, and visual field of each eye were at all times normal.

Discussion

It has been our aim in reporting together these two groups of cases, and in giving the detailed history of the cases of epithelial dystrophy observed over a period of some years, to illustrate the relationship which we believe exists between the changes in the corneal endothelium and the epithelial dystrophy described by Fuchs. The presence of endothelial changes in cases of corneal dystrophy has been noted both by Kraupa[12] and by Vogt[13]. As far as these observations go they are in agreement with our own, excepting that these writers regard the deposits on Descemet's membrane as pigmented. It is true that on direct illumination a brilliant golden sheen is observed simulating pigment, but on retro-illumination only a few pigment granules are seen. The picture has been very aptly described by Vogt[13]. It is as if "powdered bronze had been dusted over the back of the cornea." With such agreement in description there can be no doubt that the picture seen by him and by us is the same.

The point which we desire to emphasize, however, is not merely that endothelial changes are present in cases of corneal dystrophy, but that in one of our cases (Case 3) the *endothelial* changes clearly preceded those in the *epithelium*, while in the other two of our cases, there is excellent presumptive evidence that the same course of events took place.

The endothelial changes seen in our cases of dystrophy are identical with the endothelial changes in cases without dystrophy. These facts would indicate that the endothelial changes, and the

epithelial dystrophy of Fuchs, are not separate disease entities, but are to be considered together as the beginning and the end of a single disease process, though undoubtedly, the rate of progress of the disease is so slow that many cases fail ever to advance beyond the early stages.

The histology of the changes in the epithelium and stroma has been studied by Fuchs and Uhthoff[11] in small bits of tissue excised with a trephine, but the histology of the endothelial changes has not as yet been investigated. The appearance under examination with the corneal microscope strongly suggests, as has been pointed out by Vogt, that the elevations of the endothelial surface are due to structure similar to the "drusen" or Henle warts of Descemet's membrane, which are so commonly found in the periphery of the cornea in elderly persons.

No light has as yet been thrown on the aetiology of this peculiar condition. Whether the epithelial changes result from the injury of the endothelium or whether both result from some other cause would seem in the present state of our knowledge an academic question. The fact that the endothelial changes can exist for years before the epithelial changes develop would point, perhaps, to some other, as yet unknown factor, as cause for the whole disease process.

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AN UNCOMMON LUXATION OF THE LENS

BY

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OCULISTS are well aware of the fact that after a blunt injury to the eye the lens may be luxated: either disappearing in the vitreous or entering the anterior chamber, or even escaping altogether from the eye through a rupture in the sclera. But I have never heard of a lens being completely reversed as in the following case.

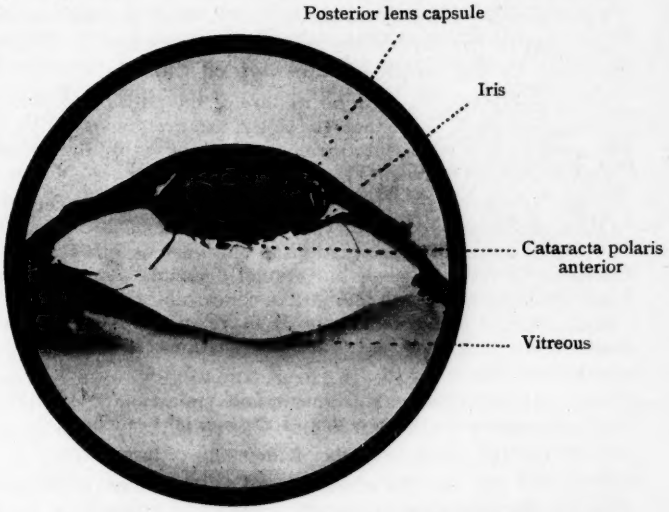
An old woman came to the clinic complaining of severe pain in and above the right eye. She informed me that thirteen years ago she had a severe blow on the eye with a broomstick, and that the eye was blind since then, but that it had never given her any discomfort until three days ago.

In the anterior chamber a yellowish lens-shaped mass could be seen, nearly filling the whole chamber.

Examined with the slit-lamp, its surface, lying against the posterior surface of the cornea, showed a peculiar woolly appearance, closely resembling a small powder puff. It was taken for an

abnormal kind of cataracta polaris anterior, that had formed on the surface of the luxated lens.

The blind, glaucomatous eye was enucleated, and microscopic sections were made. We were surprised to find that this powder-puff-like surface was in reality the posterior face of the lens. Under the thin capsule was a layer of loose, flocculent lens substance, which caused the peculiar appearance. The anterior surface, bearing a large wrinkled capsular cataract, was turned towards the vitreous, and was firmly attached to the anterior parts of the iris, which had slipped behind the lens. (See figure.) It is difficult to explain the mechanism that caused this complete retroversion of the lens.



As, however, the patient's other eye was found highly myopic (14 D), it is probable that the wounded eye was also myopic, and consequently had a liquefied vitreous, and a weakened zonula Zinnii. The blow with the broomstick may have ruptured the zonula and pushed the lens into the vitreous, which, in its liquefied condition, offered no resistance to the lens making half a revolution on its horizontal axis.

It is not uncommon for a luxated lens in the vitreous, entirely freed from its connections with the ciliary body, to slip back into the anterior chamber when the patient bends his head. This may have happened to our patient, and thus the lens may have re-entered the anterior chamber in the reversed position, in which it ultimately became fixed.

The posterior portion of the eyeball showed the ordinary signs of secondary glaucoma.

ANNOTATIONS

National Council of American Ophthalmologists

Attention has already been directed in the December number of this journal to the valuable report on the teaching of ophthalmology by a Committee of the American Ophthalmological Society, contained in their Transactions for 1923.

Another item in that volume, which merits more than a passing notice, is contained in the report of the Executive Session of the Society. It was there announced that the American Academy of Ophthalmology and Oto-laryngology had invited the Society to take part in the formation of a National Council. The resolution adopted by the Academy was worded thus:

"Believing that the general welfare of the public and that of ophthalmology, otology, and oto-laryngology, can best be served by the creation of some central representative committee chosen by the various existing accredited special societies;

"*Be it resolved*: That the Council of the American Academy of Ophthalmology and Oto-laryngology appoint such delegates who shall join with members appointed from the various other societies for the purpose of forming such a National Council. This National Council shall concern itself with all matters concerning the welfare of the special branches and that of the public in relation to the practice of such specialties. Among its various functions it shall take measures necessary to:

"(*a*) The establishment and maintenance of higher medical standards for the practice of the special branches.

"(*b*) For the proper influencing of legislation.

"(*c*) For the education and enlightenment of the general public through whatever channels it may find proper."

The Committee of the Society reported in favour of this resolution and the President was asked to appoint a member to serve on this National Council.

Our readers are aware that a few years ago ophthalmic surgeons in Great Britain became impressed with the advisability, nay more, the necessity, of a central committee representative of ophthalmologists throughout the kingdom, to which the interests of ophthalmology might be entrusted. The result was the formation in 1918 of the Council of British Ophthalmologists.

Ophthalmic surgeons in this country will welcome the decision of their American colleagues to establish a National Council and will note with gratification that its aims and objects run parallel to those of the British Council. It may well happen that mutual co-operation may strengthen the hands of the two bodies, and

stimulate the members in their endeavours to promote the interests of their branches of medicine in the widest sense.

It is generally conceded that the work already accomplished by the Council of British Ophthalmologists has fulfilled the expectations of its founders, and has more than justified its formation. We shall probably be safe in prophesying that a few years hence the American National Council will possess an equally commendable record.

Optical Benefits

The daily Press has recently drawn attention to the autocratic way in which the Ministry of Health administered the National Health Insurance Act, in so far that the permanent officials are able to impose penalties on panel practitioners. It seems also that they are able to alter the statutory rules and orders of this Act. Under the Additional Benefits Regulations, 1921, the payment of the whole or part of the cost of optical treatment and appliances was only to be made on the production of a prescription by a qualified practitioner or a hospital, except in cases where a claim is in respect of the renewal of an appliance. In other words according to this schedule no payment should be made by a society for the cost of spectacles, unless they have been prescribed by a medical man. The Ministry of Health have taken upon themselves not to insist upon the prescription of a medical man where the Insurance Society does not desire it. The result is that the diagnosis of the defects of vision is largely placed in the hands of opticians, who administer the optical benefits for the approved societies. It is hardly necessary for us to say that such optical treatment cannot be safely undertaken without a full knowledge of diseases of the eye, and the administration of ophthalmic benefits by most of the approved societies as now carried out is fraught with danger to the public, not only with regard to their eyesight but even in some cases to life.

It is to be hoped that the Royal Commission which is shortly going to report on the National Insurance Act will take cognisance of this anomaly, and will take into consideration the report which has been issued on sight-testing opticians by the Council of British Ophthalmologists (Vol. VI, 1922), and the recommendations of the Departmental Committee on the "Causes and Prevention of Blindness," 1922.

ABSTRACTS

I.—PHYSIO-PATHOLOGY OF OCULAR FATIGUE

Oblath, Prof. G. (Trieste).—Physio-pathology of ocular fatigue. (Physio-pathologie de la fatigue oculaire.) Paper read before the Congress of Hygiene, Paris, 1924.

Prof. Oblath begins by pointing out that as modern life makes a much greater demand on the visual apparatus than did the life of the past, functional and even grave anatomical trouble may arise, especially when the work required is done under unsatisfactory conditions. In the present paper the author does not deal with the results on the ocular apparatus, but makes an analysis of the direct and indirect causes of ocular fatigue.

Among the direct causes of ocular fatigue he places at the head of the list the intensity of the light. Deficient illumination is of the first importance, since it causes the workman to approach too near his work and so affects his convergence and accommodation, and finally the whole visual apparatus. Thus in a plaster mine at Baden the workmen suffered from lacrimation, photophobia, conjunctivitis, rapid fatigue when reading, and involuntary disordered movements of the eyes. All these symptoms diminished and finally disappeared on improving the illumination. He also points out how the ocular and general fatigue due to insufficient illumination predisposes to industrial accidents. Excessive illumination also produces its own evil effects, but is not so common in industrial conditions.

In this connection the annular scotomata, limited to the paracentral zone and described by Zade, Jess and Wagner, which are met with in aviators, are instanced. Ocular fatigue depends equally on the brightness of the source of illumination and on the nature of the work and its relation to the light distribution. Light contrasts are also of importance in certain occupations. The brightness of the source of illumination has much more influence on the pupillary movements than has its distance. The irregular contractions of the pupil produced by too intense a source of light deprive the eye of part of its natural protection. It is also of importance that the source of light should be stable and not vitiate the atmosphere or raise its temperature. Rules have been drawn out for the position of the source of light, due attention to which reduces both ocular fatigue and the risk of accident. Further, the position of the source of light is of importance for the effect produced on the retinal periphery. This depends partly on the intensity of the light and partly on whether the light beam reaches

the eye through the sclerotic or through the pupil. Central colour perception may be affected by a disproportion between the light on the work and the lateral illumination. The quality of the light is of great importance. The eye only perceives one-tenth of the solar spectrum, that is to say, radiations of a wave length between 0.76 and 0.396μ. The invisible rays may produce serious damage from their thermal or chemical action. Ultra-violet rays in solar light are not present in excessive quantity and are largely absorbed by the atmosphere. Those which reach the eye are absorbed by the cornea and lens, but in particular conditions of individual susceptibility, most frequently in young persons, a minimal amount of such rays may reach the retina and produce some functional disturbance (diminution of visual acuity and field, scotomata, photophobia). Snow-blindness and the erythropsia described by Fuchs are due to the action of the ultra-violet rays. Artificial light in schools and factories should have a spectrum as nearly similar to that of the sun as can be obtained. The intensity of artificial light increases with the amount of more refrangible and ultra-violet rays, which, if present in excess, may be injurious to the eyes. Schanz considers that the retinal disturbance produced by these rays is due to the fluorescence they excite. Cinematographic actors suffer from ocular troubles, mainly affecting the superficial parts of the eye, but which may also affect the iris and retina. Infra-red rays are still more important in the pathology of industry (glass-blowers' cataract, etc.). In the estimation of the sufficiency of illumination the colour factor should receive attention. The human eye is best adapted to radiations corresponding to the middle part of the solar spectrum; blue is the most fatiguing colour, and green the least. Thus monochromatic green and yellow are favourable for central vision, but, according to some authors, may produce retinal fatigue. Red light has an exciting effect, while the light of the right half of the spectrum has a sedative one. The neon lamp of Claude, in which rays between orange and red predominate, is well tolerated, and does not cause ocular fatigue nor provoke any marked disturbance of the chromatic sense.

Amongst the *indirect* causes the attention necessary to certain responsible work (engine-drivers, chauffeurs) is of great importance. To this must be added the fatigue due to strained position. Other causes are to be sought in the smallness of the work (tailors, watchmakers, workers in precious stones) and in the unsatisfactory physiological conditions of life led by the workers. The correction of errors of refraction is of great importance as these, especially marked degrees of astigmatism, predispose to ocular fatigue. High degrees of ametropia are frequently accompanied by heterophoria, which is also a cause of ocular fatigue. Much has been written on the connection of near work and myopia. The natural selection of

work best adapted to their visual conditions combined with heredity accounts for the predominance of myopes in certain professions. The fact that myopia is less frequent in rural populations is probably due to the better hygienic conditions. It is of great importance that the individual should not be allowed to select a profession for which his visual acuity, extent of visual field, fusion capacity, and light and colour sense are not sufficiently good.

Prof. Oblath finished his paper with the following conclusions:

"Leaving on one side technical prescriptions concerning the lighting (see L. Gaster's report), let us draw attention to a certain number of points from the medical side.

"The school doctors should be consulted on the choice of a profession especially in relation to the visual function. In addition to the central vision it is necessary to take account of the peripheral retinal functions, of the light and colour sense, and finally of the predisposition to congestion of the lids and conjunctivitis. Persons with only one eye should not be allowed to choose a profession which implies a permanent risk to the sight.

"Ocular fatigue will be avoided by a careful examination of individuals at the time of entry into a profession. Ocular troubles (errors of refraction, of accommodation, or of the muscular apparatus) incompatible with the exercise of a profession should be rigorously treated and verified in the course of later visits. It has been noted that the visit on engagement has considerably reduced the number of accidents, and renders the work of the experts engaged in estimating the sequelae of industrial accidents easier. In so far as there is no real professional myopia, this preventive visit will permit of the determination of the aptitude of the individuals for special work, and will suggest further the hygienic measures suitable for the elimination of the causes of injurious complications.

"The use of appropriate glasses will prevent the troubles of ocular fatigue and the pathological changes due to injurious radiations. The spectacle frame should be simple, not easily heated, and capable of being worn continuously. The choice of lenses will depend entirely on the nature of the work; they should arrest all injurious radiations and be controlled spectroscopically.

"In addition to these fundamental principles of hygiene in connection with the visual apparatus, a satisfactory organization of the work will aid in the struggle against ocular fatigue. The work should not be excessive, nor prolonged beyond physiological limits; the duration being naturally proportional to the nature of the operations performed. In work necessitating minuteness and rapidity, frequent interruption (*pauses intercalaires*) of the work will act as an efficacious means of preventing ocular fatigue."

E.E.H.

II.—TRACHOMA

(1) **Revue du Trachome.** Published at 19, Rue de Bourgogne, Paris, January, April and July, 1924.

(1) The above-mentioned Journal is the organ of the Anti-Trachoma League, which came into being on April 30, 1923, at the Institut Pasteur, with the full approbation of the Société française d'Ophtalmologie, principally by the efforts of Charles Nicolle, Morax, Aubaret, Cuenod and Paul Petit. The Central Committee, in addition to these, includes Sergent, Coutela, Truc, Lagrange, Mawas, Bailliart and Tendron. The honorary presidents are Dr. Roux, Director of the Institut Pasteur, the Ministers of Foreign Affairs, of the Interior, of the Colonies, and of Public Health, the Governor General of Algeria, Maréchal Lyautey, the Resident General of Tunisia and the Governor General of Indo-China. The honorary members are Gouzien, Calmette, Abadie, de Lapersonne, Leon Bernard, MacCallan, Cirincione, Marquez, Gallemaerts and Manolescu. The annual subscription for ordinary members is 20 francs.

Numerous interesting papers have been read at the various meetings of the League at the Institut Pasteur and have been published in the *Revue du Trachome* which will be briefly noticed here.

Jeandelize and Bretagne speak of the incidence of trachoma in the industrial centres of Lorraine and of the increase in the disease since the war.

Sedan and Hermann, of Marseilles, recommend for the treatment of corneal ulcers the detachment of the conjunctiva around the cornea and suturing it over the cornea, entirely burying the cornea.

Aubaret, Rouslacroix and Hermann, of Marseilles, publish new histological and cytological researches. They recall the recent work of Solovief in the *Archives des Instituts Pasteur de l'Afrique du Nord*, in which he shows that the corpuscles of Prowazek are not of a parasitic nature, but products of the destruction of the cellular nucleus.

Morax has an interesting article on the difficulties in the diagnosis of trachoma. He mentions the following conditions as of importance in the differential diagnosis: follicular conjunctivitis in persons who are in the habit of using certain public swimming baths; syphilis of the conjunctiva of follicular type; acute follicular conjunctivitis in association with a chronic suppurative dacryocystitis; follicular conjunctivitis; spring catarrh.

Talbot describes his attempt to introduce prophylactic measures in the schools of Annam, and his arrangements for treating the pupils who are infected with trachoma. The percentage of infected

pupils varies from 34 per cent. to 86 per cent. in various places. This important work shows that the Annamese authorities have been brought to realize that there is only one way of attacking trachoma in a country which is heavily trachomatized.

Charles Nicolle states that in Tunisia there are numerous strains of the Weeks bacillus and in order to prepare a vaccine or a serum efficacious against all varieties, it is necessary to work with several strains.

Several authors have referred to the treatment recommended by Nicati for florid trachoma or what in Egypt is called stage two of trachoma. This consists in the injection underneath the conjunctiva just behind the tarsus of 1cc. of a 0·5 per cent. solution of copper sulphate, combined with an anodyne such as novocain. This is employed once a week for five or six weeks.

It is important to know that from April 1, 1924, trachoma has become a notifiable disease in France, by Presidential decree, and disinfection of the sufferer is obligatory.

A. F. MACCALLAN.

(2) **Paton, D. D.—Trachoma.** *Med. Jl of. Australia*, May 24, 1924.

(2) In Western Australia **Paton** found 3.26 per cent. of 10,000 consecutive private patients trachomatous, while among out-patients at the Sick Children's Hospital, Perth, 8·3 per cent. were similarly affected. These important statistics deserve the attention of the Public Health Department of the Australian Government. If properly organized an ophthalmic campaign under government auspices should be able to stamp out trachoma in ten years; but it would of course cost money.

A. F. MACCALLAN.

(3) **Telles, Rudge, W. (Sao Paulo).—Trachoma and its prophylaxis in the State of Sao Paulo. (O Trachoma e Sua Prophylaxia no Estado de Sao Paulo.)** 1924.

(3) This is **Telles'** thesis for the degree of Doctor of Medicine and Surgery which was approved with distinction; it forms a well got up brochure of 160 pages, illustrated by a map and eight cuts in the text. Trachoma is trachoma all the world over, from Paris to Spitzbergen and from Bassorah to Baghdad* ("Oh blessed Joseph Finsbury"!)† and so it is not necessary to abstract this booklet very fully, but it is interesting to note that the disease is of quite recent development in Sao Paulo. Before 1889 there were no cases in the State; emigrants introduced it and it has flourished

* "The Wrong Box," by R. L. Stevenson and Lloyd Osbourne.
† Kipling. "A Diversity of Creatures."

amazingly. At the present time there must be, at the lowest computation, 200,000 trachomatous persons in the State; in the municipality of Cantaduva more than 20 per cent. of the population are affected by the disease. The author is insistent on the necessity of compulsory notification of the disease with isolation of the sufferers. The map is valuable as it shows in a graphic manner the percentage of the population affected with trachoma in the various parts of the country; it is interesting to see that the sea coast areas are practically free from the disease, with the exception of the Capital which is not far from the Atlantic Ocean. From the Capital the disease follows the lines of railway, the heaviest shading occurring at Cantaduva, which appears to be situated on a branch of the Rio Grande. Judging from the map, the disease would appear to be railway and road borne rather than water borne by way of the great rivers.

R.R.J.

III.—INTRA-OCULAR FOREIGN BODIES

(1) **Davenport, R. C. (London).—Notes on three cases of intra-ocular foreign body.** *St. Bartholomew's Hospital Reports*, Vol. LVII, part ii, p. 141. 1924.

(1) **Davenport** reports three cases of penetrating injury, and illustrates with clear drawings and micro-photographs.

The first is the case of a penetrating wound of the cornea by a broken eye-glass. An implantation cyst in the anterior chamber followed, and as the cyst grew, an implanted eye-lash was visible on the surface of the cyst. An iridectomy was performed and the lash removed. Seven months later, there was a recurrence of the cyst. By means of incision into the eye behind the limbus in the angle of the anterior chamber beneath a large conjunctival flap turned forward, the cyst was removed completely. Examination a month later revealed the eye to be without any sign of recurrence of the cyst. It was in a satisfactory condition apart from some resulting astigmatism.

Case II was a soldier who lost one eye as the result of the explosion of a detonator, and injured the second eye at the same time by penetration with a metal fragment. The foreign body was retained on the anterior aspect of the suspensory ligament of the lens at six o'clock, as was discovered later, after a period of four years. Owing to the development of slight iritis and X-ray evidence of the presence of a foreign body, an iridectomy was performed below, but without success in removing the foreign body, which was not discovered at the time. When the eye quietened

down, the foreign body was detected. As all inflammation had subsided, no further treatment was adopted.

The third case was of penetration of the eye-ball by a link of a gold chain, with wound of the iris, traumatic cataract and retention of the foreign body. It was not found possible to remove the link and so, owing to danger of sympathetic ophthalmitis and to the persistent inflammation of the injured eye, this eye was removed.

HUMPHREY NEAME.

(2) **Donovan, F. A.—Foreign bodies in the lens.** *Jl. of Amer. Med. Assoc.*, October 11, 1924,

(2) **Donovan** reports three cases in which the lenses were injured simultaneously by the same explosion of giant blasting powder.

" In the case of a boy, aged 13 years, which I reported in 1911, both of the lenses contained several pieces of giant cap, which were extracted by a regular combined cataract extraction six days after the injuty, on the two eyes at the same time, under a general anaesthetic. At present, after 13 years, this boy has practically normal vision with only one pair of lenses for near and distance: R. + 6.00 D. sph. ⌒ + 3.25 D. cyl. ax 105°; L. + 6.00 D. sph. ⌒ + 3.25 D. cyl. ax 30°. However, not all cases have so fortunate an outcome.

In three extractions of the lens by the regular method from one eye of each of three boys injured by exploding several giant caps, two were entirely satisfactory, but in the third, at a later examination, I found a piece of brass in the remaining capsule, which, by the way, after four years, still remains there, apparently inert. In the other eye, a piece, which, at the time, was obscured by the upper edge of the iris, fell down after several weeks and became embedded in the lower anterior capsule, and, with a small scar surrounding it, remains there; the body of the lens and the rest of the capsule are transparent. The boy lives in the country, and attends school regularly. Circumstances prevented his being able to remain in the city under observation, which may have been to his advantage. For four years this boy has had one piece of brass cap in the posterior remaining portion of capsule in one eye, and another piece in the anterior capsule of the other eye, and they still appear to produce no irritation. Incidentally, giant, or blasting caps contain the very highest fulminate explosives, in comparison with which, for its concussion effect on the eyeball, dynamite is almost a plaything."

These cases impressed on the author the necessity of finding some more reliable method for removing a small non-magnetizable foreign body from the lens. Therefore in the next case he had he removed the foreign body by suction by the following method:

"A small puncture is first made in the cornea with a knife. Through this the bevelled, sharp pointed, aspirating needle is inserted into the lens, care being taken to have the hole in it cover the foreign body. It should be gently pressed into the lens matter so that a complete vacuum is obtained.

This method has the additional advantage of being able to extract two-thirds or more of the lens at one sitting, after the foreign body has been removed, thus avoiding the complications resulting from the subsequent swelling. When an attempt is made to extract all the lens this way, there is much danger of including some vitreous with it; so one should err on the safer side. The remaining lens matter usually appears to take care of itself in time. I use a simple piston syringe connected with an aspirating needle by a short, pliable rubber tube."

The needle used is about the same size as the needle used for spinal puncture.

A. F. MACCALLAN.

IV.—IMMUNITY AND PREVENTIVE OPHTHALMOLOGY

(1) **Teulières, Dr. M. (Bordeaux).—Stock vaccines in ophthalmology. (Les stock-vaccins en Ophtalmologie.)** *Arch. d'Ophtal.*, October, 1923.

(1) **Teulières** gives an account of his experiences with stock vaccines in 71 cases of varying inflammatory (microbic infections) ocular conditions. He has preferred to make use of lipo-vaccines as he has found that it is possible to inject with safety a greater dose of this preparation than of the watery one. He has used the doses prescribed by the Pasteur Institute or by the makers of the various special vaccines. On the whole the results have been encouraging. The local reaction has been slight as has also the general reaction with monomicrobian vaccines. With the plurimicrobian vaccine (*lipo-vaccin antipyogène*) the general reaction has been very various. Thus when used as a preventive injection for cataract operation the reaction is very mild, but may be very severe, though never, in the author's experience, alarming, in such cases as localized suppuration following cataract extraction. The author concludes his paper by a brief discussion of the theoretical basis underlying the use of stock vaccines, serums, milk and peptone.

E.E.H.

(2) **Paton, D. D.—Preventive ophthalmology.** *Med. Jl. of Australia*, May 17, 1924.

(2) This is **Paton's** opening address as Chairman of the Ophthalmological Section of the Australian Branch of the British Medical Association. The author is well acquainted with continental literature.

The method of Lindner of examining epithelial scrapings from each lid and from diametrically opposed areas on the bulbus has led to the valuable observations that smears of secretion and cultures made from the same source may give a negative, but an epithelial scraping preparation from the same case a positive finding; a most probable explanation of post-operative infection where the usual bacteriological examination gave no warning.

The obvious moral is in suspicious cases not to be content with an initial failure to grow bacteria from a secretion smear, but to corroborate it by an epithelial preparation from the lower and upper lids. These investigations have further demonstrated the frequent invasion of the bulbar before the palpebral conjunctiva by pathogenic organisms which apparently continue the pathological process, as Lindner suggests, by passing from one minute area of acquired immunity to another, as yet unprotected.

The value of his method in early diagnosis is exemplified in the case of a student who presented himself for examination, as he feared he had infected his eye with gonococci about 18 hours previously. There was only a slight hyperaemia and no purulent discharge, but the epithelial specimen from the inferior portion of the conjunctiva displayed gonococci. Only eight hours later did flecks of muco-pus appear. The case turned out to be one of unusual severity leading to perforation and subsequent reduction of visual acuteness, in spite of iridectomy, to one-tenth of normal.

This case is a very dreadful one. No description is given of the treatment adopted. It is difficult to believe that adequate applications of silver nitrate were used, in conjunction with irrigation of the conjunctival sac. It may have been the patient had been inadequately nourished, causing defective vitality, as has been so frequent in Central Europe especially amongst medical students and practitioners. This inadequate nourishment of individuals, affecting of course those who are about to be operated on for glaucoma, is responsible, we believe, for the insufficient barrier to post-operative intraocular infection, which is afforded by the abnormal tenuity of the flap of conjunctiva and episcleral tissue which closes off the trephine hole. This is the real reason in all probability for the unpopularity of the sclero-corneal trephine operation of Elliot, to which the author refers as existing in Central Europe.

A. F. MACCALLAN.

(3) Woods, Alan C. (Baltimore).—The application of immunology to ophthalmology. *Arch. of Ophthal.*, July, 1924.

(3) **Woods** gives an excellent survey of the work done by various observers including himself, on protein sensibility as applied to ophthalmology. The broad principles underlying sensitization and anaphylaxis of the tissues of the eye are:—

1. If general sensitization of the body occurs, the ocular tissues are also sensitized.

2. If, with the body in this condition, an intoxicating injection is given in the eye, local inflammation of the eye results, but if the injection be given in the body, there are symptoms of general anaphylactic shock only.

3. If the sensitizing injection be given in the eye, the eye becomes specially sensitized in addition to the general sensitization of the body, and with an ocular injection focal inflammation is obtained and little general reaction. If, instead, the intoxicating injection be given in the body, not only is a general anaphylactic shock obtained but there is also an especial local inflammation in the eye.

With regard to conjunctivitis, the varieties occurring in hay fever, pollen hypersensitivity, food anaphylaxis and phlyctenular disease are of the nature of immune reactions. Fort studied 28 cases of spring catarrh; 12, out of 19, in whom blood counts were made, showed eosinophilia, and in each of the 19 a definite pollen hypersensitivity was found. Desensitization was attempted in 15 cases. One case was completely cured, 13 showed definite improvement, and one was lost sight of. Three cases of conjunctivitis due to food anaphylaxis are reported by Condon. The first was dependent upon dietetic indiscretions, the second upon hypersensitivity to certain fish protein. The conjunctivitis disappeared on abstention from the suspected food.

Phlyctenules are possibly an allergic phenomenon related to a tuberculous infection. In support of this, is (i) the observation that 801 out of 942 cases collected from the literature showed a tuberculin hypersensitivity. (ii) In a certain percentage of tuberculous animals, phlyctenules may be produced by the instillation of tuberculin into the conjunctival sac. (iii) Phlyctenules have been found as part of the Calmette reaction.

For phlyctenules to develop there must probably be an especial hypersensitivity of the ocular tissues to the tuberculo-protein such as would be produced by the presence at some time or other, of a minute focus of tubercle in the eye. In support of this is the observation that a patient who has previously shown a positive Calmette reaction will develop an inflammatory reaction in the tested eye, and none in the untested eye, after a subsequent injection of tuberculin.

If one cornea of an animal be sensitized by intra-lamellar injection of the antigen, a later intoxicating injection of the same antigen into the same, the fellow eye, or through the blood stream, produces an interstitial keratitis. Thus a negro scratched his right eye with a blade of corn and developed a violent keratitis. General and special examinations, Wassermann, etc., were negative, but there was marked hypersensitivity to corn pollen, and treatment by desensitization was eminently successful. The interstitial keratitis of syphilis is probably dependent upon a sensitization of the cornea by the spirochaete or its products early in life and a subsequent anaphylactic keratitis on further absorption of the syphilitic virus. Similar reasoning may apply to the tuberculous variety.

The lens is organ specific and not species specific, and an animal can be made sensitive to its own lens protein by injection of the lens protein of a different species, so that subsequent absorption of its own lens protein will produce allergic phenomena. This is the basis of Verhoeff's and Lemoine's work on phakoanaphylactic endophthalmitis, recently abstracted in this Journal.

Römer and Gibb have demonstrated in the blood serum of a young diabetic with cataract, specific anti-bodies for lens protein; they showed that the lens capsule was permeable to cytotoxic bodies and were of the opinion that cataract was due to a reaction taking place between the blood serum and lens protein. Ginger and Smith produced lenticular lesions in the offspring of a rabbit by immunizing it, while pregnant, with rabbit lens protein. The ocular defects, moreover, became hereditary.

Elschnig believed that in sympathetic ophthalmitis the pigment epithelium injured in the exciting eye was absorbed from the eye of the patient. A hypersensitiveness to pigment was thus created, especially in the fellow eye and any further absorption of pigment caused an anaphylactic reaction in it. Woods has found that in wounds of one eye involving the uveal tract, where sympathetic ophthalmitis does not occur, antibodies to pigment can be demonstrated in the blood serum and in cases where it does occur, a definite cellular hypersensitiveness to pigment can be demonstrated in the blood serum by a skin test. It is possible that the presence of focal infection or systemic disease may cause the development of a hypersensitivity to uveal pigment rather than an immunity to it.

The author now proceeds to discuss methods of diagnosis. For tuberculin hypersensitivity, he advocates the intradermic injection of 1/20 cc. of dilutions of tuberculin "of known potency," the dilutions used being 1: 100,000, 1: 10,000 and 1: 1,000, using stronger solutions if there is no reaction. For pigment reactions he uses three solutions, "a normal suspension," a 1: 10 dilution, a 1: 50 or a 1: 100 dilution. Intradermal injections are made on the flexor

surface of the forearm and in positive cases, a local hyperaemia and elevation comes on in from one to twenty-four hours.

F. A. WILLIAMSON-NOBLE.

(4) **Rovirosa (Madrid).—The practical applications of immunity in ophthalmology. (Les applications pratiques de l'immunité en ophtalmologie.)** *La Clin. Ophtal.*, February, 1923.

(4) This article by **Rovirosa** appears to be a translation from the Spanish and to have as its main object to draw attention to the previous work of the author in various Spanish journals in 1915 and 1916. One can well understand that if this work could be made more available to English readers than its appearance in Spanish implies its interest would be very considerable. The present article, however, is too general to be of much service. It recapitulates the general principles of the use of sera and vaccines, and their great value in the treatment of infective eye diseases, but, since there are no case records and no statements as to the various dosages required, in fact, no precise instructions how to obtain the author's results, its value seems to be limited to the direction of attention to what has already been published in, notably, *Revista Ibero Americana de ciencias medicas* and *Revista de medicina cirurgia practicas.*

ERNEST THOMSON.

V.—GLAUCOMA AND INTRAOCULAR TENSION

(1) **Holland, H. T.—Hereditary glaucoma affecting three generations.** *Indian Med. Gazette*, August, 1924.

(1) On the Baluch-Persian frontier **Dr. Holland,** of the C.M.S. Hospital, Quetta, came across three brothers, Mahommedans, all blinded by double chronic glaucoma at ages of about 55 to 60 years. Iridectomy had been performed by Col. Smith, of Amritsar upon one of the patients without benefit. Later, a fourth brother was discovered, also blind in both eyes from glaucoma; and enquiry elicited the history that their mother, too, had lost her sight in the same way at about 50 years of age. Finally, a glaucomatous male member of the third generation, aged 30, came to Dr. Holland, with vision of one eye quite lost, and of the other eye nearly so. A broad iridectomy produced some slight improvement in the latter eye.

This patient is the only member of the third generation yet affected. He has a brother and three sisters, and his three blind uncles all have children; two of them have each a son and two daughters, and the other one has two sons alive. Though the fact is not definitely stated, one infers that there were no members of the second generation alive who had escaped the disease.

H. HERBERT.

(2) **Gradle, Harry S. (Chicago, Ill.)—The preglaucomatous eye.** *Amer. Jl. Ophthal.*, August, 1924.

(2) **Gradle,** gives an attractive explanation of the origin of an attack of acute glaucoma by correlation of various well known factors in the production of the disease. These factors are:

(1) Anatomical depth of the anterior chamber, location of the scleral spur, size of the spaces of Fontana, character of the endothelium, closure of the filtration angle by the base of the iris, etc.

(2) Lack of tonicity of the vasomotor sympathetic nerve fibres. Magitot is quoted to the effect that "the choroid is in reality a vascular reservoir which has for its purpose the maintenance of normal intraocular tension." This blood reservoir is under the control of the sympathetic. Leriche reports a case where the sympathetic chain round the internal carotid was resected and there resulted miosis, dilatation of the retinal vessels and increased intraocular tension. It is suggested that the cavernous plexus of the internal carotid artery is responsible for regulating the size of choroidal vessels when changes occur in systemic blood pressure, so maintaining a constant intraocular pressure. Thus the regulation of intraocular pressure is to some extent dependent on the capability of this mechanism to function.

(3) A temporary rise in systemic blood pressure.

Gradle then assumes that we have an individual with an eye anatomically predisposed to glaucoma in whom there is for some unknown reason, a lack of tonicity of the vasomotor sympathetic nerve fibres. In consequence of this, the cavernous spaces of the eye are filled to their maximum. A rise in systemic blood pressure now occurs, due to a heavy meal, an emotional crisis, or any of the factors which commonly precipitate an attack of acute glaucoma; this rise cannot be compensated for within the eyeball, and the pressure within the vitreous chamber rises. This produces forward movement of the lens, zonule and iris, thus establishing the well known vicious circle in acute glaucoma.

F. A. WILLIAMSON-NOBLE.

(3) **Vollaro, Prof. Lieto (Florence).—The technique and results of Lagrange's sclerectomy in the treatment of chronic glaucoma. (Indication technique et résultats de la sclérectomie de Lagrange dans le traitement du glaucome chronique simple.)** *Arch. d'Ophtal.*, June, 1923.

(3) In this contribution to the records of the treatment of chronic glaucoma, **Vollaro** gives the results obtained by him during seven years. He has, in an earlier paper in the *Bolletino di Oculistica*, 1922, published his cases in greater detail. The number operated upon and watched over periods of one year and upwards

was 49. In all an appreciable lowering of tension was obtained and in the majority this reached the physiological level, or descended below it. The actual degree is given in millimetres of Hg. In only three cases was there continued slow deterioration of central vision. The technique adopted by the author is described and illustrated. It does not differ in essentials from that advocated by Lagrange.

While there is nothing especially noteworthy in Vollaro's paper, it is an interesting study and report of a series of cases, with careful clinical observations extending over long periods after operation.

J. B. LAWFORD.

(4) **Lobel, A. (Bucharest).—Can we guard against late infection in Elliot's operation? (Peut-on prévenir les infections tardives dans l'opération d'Elliot?)** *Arch. d'Obhtal.*, April, 1924.

(4) **Lobel**, after referring to the catastrophies reported by various operators, whereby eyes have been destroyed as long as seven years after trephining, and noting that statistics of late infection have ranged from 3 per cent. (Hegner) to 14 per cent. (Pillat), describes the procedure he has adopted in an endeavour to safeguard his patients. Recognizing that the danger of late infection is greater if the covering of the trephine aperture is thin, as is usually the case after an operation on the lines laid down by Elliot, Lobel aims at obtaining a thicker conjunctival covering and limiting the sub-conjunctival area occupied by escaping aqueous.

He has so far operated upon 28 cases by this method, with good results in every instance. The longest time since operation is three and a half years.

The steps of the operation are:

(1) The bulbar conjunctiva is dissected up from its corneal insertion over one-third of the circumference of the cornea, taking care that the whole of the subconjunctival tissue is included in the flap.

(2) A few small snips with the scissors at the base of the flap facilitates its movement at a later stage.

(3) The free edge of the flap, 2mm. in depth, is resected, in order to remove the thinnest and most fragile portion of the conjunctiva.

(4) Two silk sutures are inserted, one end in the flap, the other in the undisturbed ocular conjunctiva near the end of the original incision.

(5) The trephine is applied in the usual position and an irridectomy performed.

(6) With a fine galvano-cautery point, the cornea is gently touched, in a semi-circle at the lower edge of the trephine aperture.

(7) The sutures are tightened, pulling the flap downwards, so

that it covers nearly half the cornea. The threads are then tied and a thick well-nourished conjunctiva lies over the scleral aperture.

(8) The stitches are removed on the fifth day. The conjunctiva is then adherent to the cauterized surface.

The author states that a point of interest to note is the difference between the almost transparent thin conjunctiva over the trephine wound, in the operation as usually performed, and the milky-white thick covering obtained by his procedure.

The article has four illustrations showing the steps of the operation. It is worth reading.

J. B. LAWFORD.

(5) **Bailliart, P. (Paris).—A new ocular tonometer. (Un nouveau tonomètre oculaire.)** *La Clin. Ophtal.*, July, 1923.

(5) **Bailliart** describes his new tonometer which seems to be rather an ingenious instrument. It is invented in order to get rid of certain inconveniences of the Schiötz instrument. The latter can be used only vertically and necessitates the patient being in the recumbent posture: this is apt to frighten the patient and causes, in addition, a waste of time. Alternatively, the head must be held horizontally, which cannot be done without great difficulty in elderly people. Bailliart's instrument can be applied in any position of the patient and is specially designed for application either to the cornea or sclera, in which latter case an anaesthetic is not required. On the dial there are three scales, the outer recording millimetres of mercury for the sclera, the middle one millimetres of mercury for the cornea, and the inner is marked in grammes for the purpose of setting and verifying the instrument. The principle of the instrument is that of a spring which pushes the stem instead of a weight which loads it as in the Schiötz, and the object of the graduation in grammes is to make sure that (by application of the instrument to a gravity balance in the manner described in the text) the gramme-figure on the dial corresponds to the actual weight applied. Since the Bailliart tonometer works by spring pressure, the horizontal could not be compared with the vertical position because in the latter case the weight of the instrument would be added to the spring pressure and the reading thereby falsified. Accordingly there is a special mechanism in the Bailliart instrument which comes into play when it is used in the horizontal position. This mechanism is not described in detail. It is apparently not automatic, but requires to be attended to by the operator. With regard to scleral *versus* corneal application, this is arranged for by the provision of alternative "feet" for application to the sclera or cornea. The exterior appearance of the instrument is illustrated but the working parts are neither illustrated nor fully described. Nor are any records of tension given, and, consequently, no comparisons are made with records

by the Schiötz instrument. One assumes, therefore, that this is an article intended to give a preliminary account of a new and relatively untried instrument.

ERNEST THOMSON.

(6) **Weekers, L. (Liege).—The effect of injections of distilled water on the ocular tension. (Les effets des injections d'eau distillée sur la tension oculaire.)** *Arch. d'Ophtal.*, February, 1924.

(6) **Weekers,** after a brief review of some of the physiological work on the intraocular pressure, comes to the conclusion that under certain conditions it is possible to diminish the intraocular pressure by increasing the molecular concentration of the blood. He made a series of experiments on rabbits by injecting distilled water subcutaneously, intraperitonealy, and intravenously. The ocular tension was measured with a Schiötz tonometer. His results were as follows: "Injections of distilled water, whether intravenous, intraperitoneal, or subcutaneous, cause an increase of the ocular tension. That increase of tension is but little marked, and is not lasting, so that it may easily pass unobserved. It is probably due to the diminution of the molecular concentration of the blood, and to the modification of the intraocular fluid, which is the result of this. The brief increase of the ocular pressure under the influence of injections of distilled water is followed by a fall of that pressure, more extensive and of greater duration. This is the result of a toxic effect which is produced whatever the method of administration may be. Large injections of distilled water provoke in the animal general disturbances and even death. For these reasons the clinical use of distilled water does not seem to be of any value."

E. E. H.

BOOK NOTICES

Affections de l'Oeil en Médecine Générale. By F. TERRIEN, Professeur agrégé a la Faculté de médecine, Ophthalmologiste de l'hôpital Beaujon; G. COUSIN, Chef de laboratoire d'ophthalmologie á la Faculté de médecine. Paris: Masson et Cie. 1924. 488 pp., 128 illustrations. Price, 40 francs.

The first part of this book comprises a short section on Anatomy and Physiology followed by a description of disease of the eye on the lines of the ordinary textbook of ophthalmology. In other words, the eye is considered in its different parts, cornea sclerotic lens, etc., and an account given of the various diseases liable to affect these structures. This account does not always coincide with accepted teaching. For example, in the section on correction of amblyopia in concomitant convergent squint the need for correction

of errors of refraction is emphasized and the use of atropin is advised because paralysis of accommodation will lead to the suppression of the spasm of convergence. This of course may well occur in some cases. The authors, however, go on to state that it is impossible to use atropin permanently, one uses it alternately in each eye, and that in this case the atropinized eye becomes straight and fixed, while the other deviates.

The third part of the book will be most interesting to those in general practice. It is headed "Ocular lesions in General Diseases." The first general disease considered is "senility" and the section gives a useful resumé of the changes occurring, one might say, physiologically, in old age. Such for example, are the increased susceptibility to subconjunctival ecchymosis, due to the great fragility of the conjunctival vessels, the tendency to epiphora due to mild degrees of senile ectropion, alteration of colour sense, slight loss of peripheral field and of central acuity of vision.

There is a section devoted to ocular troubles of menstrual origin, and here one finds mentioned, neuralgic phenomena in the region of the first branch of the trigeminal, hyperaesthesia, accommodative asthenopia, slight increase of exophthalmos in early Graves' disease, etc. These phenomena are of course quite well known, but it is useful to have them grouped together.

In the chapter on endocrine glands there are some interesting observations on Graves' disease. After partial extirpation of the thyroid gland, the exophthalmos has disappeared on the side of the resection and has persisted on the other. The exophthalmos is not due to direct action of the thyroid, but to the action of the other glands, under the influence of the thyroid, especially the thymus. This has been proved by ablation of the thymus bringing about recession of the eyes after an unsuccessful result following the removal of the thyroid. In some cases glaucoma can be traced to thyroid insufficiency: If an intravenous injection of 99 c.c. of 10 per cent. sodium chloride be given, the intraocular tension is diminished by the osmotic effect of the increased salt content in the blood. In hypothyroidism this salt content falls from the normal 1.13 per cent. to about 0.72 per cent. Administration of thyroid extract rectifies this and brings about a diminution in intraocular tension—in one case the tension was reduced from 40 to 18 mm. of mercury by administration of thyroid.

In a book of this character, when such a large field has to be covered, there must be many omissions; the account of papilloedema for example covers just about a page, but the book fulfils a very useful purpose. It contains a great deal of very interesting reading matter, some of which may be controversial, but is none the less worth while reading. The somewhat novel system of grouping cannot fail to be of use to those accustomed to hunting through the

numerous chapters of a large textbook for references to the ocular lesions occurring in a single disease.

In conclusion the book can be heartily recommended to those wishing for a comprehensive survey of French views on ophthalmology, set forth with great skill and lucidity.

The Errors of Accommodation and Refraction of the Eye and their Treatment: A Handbook for Students. By ERNEST CLARKE, M.D., F.R.C.S. Fifth edition. Crown 8vo, pp. 4 + 251, with 98 figures in the text. London: Baillière, Tindall & Cox. 1924. Price, 8s. 6d.

The new edition of this well-known and deservedly popular textbook has been thoroughly revised; there is hardly a chapter without alteration and improvement.

The arrangement of the work has been made a little more systematic; thus the section on the principles of reflection of light appears in the chapter of elementary optics, instead of forming part of the description of the ophthalmoscope; and the details of the ophthalmometer need no longer be sought in the chapter on astigmatism.

There are a few minor errors which have escaped notice; thus in Fig. 5 (which has been inverted in printing), the wave front in the denser medium appears to move forward obliquely and not in a direction perpendicular to its face; again, on page 67, under the heading of "The Indirect Method," it is said that the observer recognizes that the image is inverted by slightly moving "the focus glass and finding that the image moves in the opposite direction." When the focus glass is moved, the image moves in the same direction, but faster than the glass.

These are very small points, and in all more important things the book is a safe and valuable guide to the student.

The Extra Pharmacopoeia. By MARTINDALE and WESTCOTT. Vol. I. Eighteenth edition. London: H. K. Lewis & Co. 1924. Price, 27s. 6d.

Four years have elapsed since the last edition of this work was published and as a good deal of research has been carried out in that time, there is naturally much that is new in the present edition. The work is so well known and is so highly appreciated by the profession that it is unnecessary for us to give a lengthy review of it; it is a therapeutic dictionary which few can afford to be without.

Of the newer drugs, insulin is probably the most interesting at the present time and the details of its preparation and dosage occupy six pages. Ophthalmic surgeons will be interested in cocain and its substitutes, and all will agree with the authors' comment in their preface on the difficulties placed upon its proper sale in prescriptions which are *bona fide*. The synopsis of the Dangerous Drugs Act, 1920, and the amending Act, 1923, will be found of great value.

OBITUARY NOTICES

DANIEL VAN DUYSE

DR. DANIEL VAN DUYSE, Emeritus Professor of Ophthalmology and Pathological Anatomy in the University of Ghent, and an ophthalmologist of great distinction, died at Brussels on September 27. 1924. Born in Ghent in 1852 he was educated in his native town, graduating at the University in which, subsequently, he became Professor of Pathological Anatomy and later of Ophthalmology. This latter chair he held from 1905 to 1922. He was a good linguist and had visited and pursued his studies in many towns, Paris, Vienna, Berlin, Heidelberg, London and others.

van Duyse's scientific career was one of great activity. The list of his writings in the fields of ophthalmology and pathological anatomy includes more than 200 papers. Among them may be mentioned the records of his researches on ocular colobomata, colobomatous cysts, cyclopia, cryptophthalmia, etc.

By reason of his knowledge of ocular teratology he was chosen as the writer on this subject in the *Encyclopédie française d'Ophtalmologie*, of which Vol. II contains many of his original ideas. His first communication on this subject was presented to the International Congress in London in 1881, when he read a paper on "Coloboma of the Eye and Subconjunctival Cysts of the Orbit."

He was one of the most active collaborators on the editorial staff of the *Archives d'Ophtalmologie* from the date of the foundation of that journal, and was one of the earliest members of the Société français d'Ophtalmologie.

In 1886 in association with the late Professor Nuël of Liège, he founded the Société belge d'Ophtalmologie, of which he was an active and devoted general secretary until his death. It was during a meeting of the Executive of this Society that he had a sudden fatal cardiac attack. For several years he had suffered from cardiac disease, but with rare courage he made light of his ailment, concealing his symptoms, even from himself; he lived only for his work to which he was passionately devoted.

We are indebted to his son, Professor Marnix van Duyse, for these details.

SIDNEY JOHNSON TAYLOR

BY the death of Dr. S. Johnson Taylor many lose a warm and sincere friend, and the medical profession an experienced and skilful practitioner. He had for a long time played a prominent

part as an ophthalmic surgeon, not only in Norwich and the surrounding district in which he practised, but also in the various societies and congresses connected with his speciality, at the meetings of which he was a very regular attendant.

He received his medical education at the University of Edinburgh and St. Thomas's Hospital, London, at both of which he distinguished himself by taking medals and prizes.

He became M.R.C.S.,Eng., in 1878, and graduated as M.B. and C.M. in Edinburgh in 1882, and M.D. in 1922.

At St. Thomas's Hospital he came under the influence of the earnest and forcible teaching of Dr. Charles Murchison, who was at that time a physician to the hospital and lecturer on medicine. Taylor, as he said, being a bit of a hero worshipper, manifested his admiration and devotion to his old master in later years, by having his son christened Charles Murchison.

For a time Taylor was engaged in general practice at St. Servan near Dinard in Brittany, but later decided to take up ophthalmology as a special line of practice. At Edinburgh he had worked under Argyll Robertson, and he returned to London to work under Nettleship at St. Thomas's and at Moorfields. At the latter hospital he served as a clinical assistant, at a time when Nettleship was at his prime as a teacher, and when all those who worked for him had to do so most assiduously both in note-taking and clinical investigation.

It was in 1889 that Taylor first became a member of the Ophthalmological Society of the United Kingdom, having by that time started practice as an ophthalmologist in Norwich, where he remained actively engaged up to the time of his death.

The remarkable circumstance about Taylor's work in Norwich is that whilst he did a most extensive practice he never held a hospital appointment. Having, therefore, no beds to which he could transfer cases requiring operative treatment, he was led to perform many major operations on the eye in his consulting room or in the patient's own home, under circumstances which, in one less skilful or who knew less well what he was about, would be considered decidedly risky.

Johnson Taylor's contributions to the literature of ophthalmology consist mostly of the record of interesting cases well worked out, and of remarks in discussions on papers read by others. He was a frequent speaker both at the meetings of the Ophthalmological Society and at the Oxford Ophthalmological Congress. The racy character of his remarks to some seemed rather out of place in the sedate proceedings of scientific societies, but they were usually very much to the point, containing much practical common sense, and often helped to lighten the solemnity of the meetings.

Johnson Taylor all his life retained a great affection for Moorfields Hospital. For years it was a common practice of his to spend a day in town by visiting the hospital in the morning, going to a cricket match at Lord's or some other form of entertainment in the afternoon, and attending a meeting of the Ophthalmological Society in the evening.

His was a very familiar figure in the operating theatre, where by watching the procedures of his confrères he kept himself well up to date in all that pertained to ophthalmic technique, a matter in which he took the greatest interest.

Taylor's admiration for Moorfields was manifested in a very material way, apart from his attendance at its clinics. At the time of its Centenary Appeal, when a dinner was held to raise funds, Johnson Taylor sent a most munificent contribution, and at the time wrote a letter which so aptly expressed the warm feelings which so many hold for the institution, that Charles Wyndham, who was in the chair, read it to the assembled company with great effect.

The death of Johnson Taylor's son was his great grief in his later years. To the memory of his old teacher, Charles Murchison, F.R.S., M.D., and of his late son, Charles Murchison Johnson, he last year presented the Hospital with the sum of £1,000 for the endowment of a bed.

CORRESPONDENCE

MISTAKES

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—With reference to your interesting annotation on "Mistakes," in the November number of the Journal, and especially to one paragraph in it in which you say: "We have ourselves got into trouble for dilating the pupils of a patient, and have been accused of ruining the patient's sight," it may be of interest to recall some statements in a paper contributed to the Royal London Ophthalmic Hospital Reports, in 1863 (Vol. IV, p. 405), by Dr. Hughlings Jackson. In this paper he states that one patient ascribed the loss of vision to the application of a blister; another to the use of galvanism; and a third became blind soon after an ophthalmoscopic examination, and ascribed the loss of vision to the examination.

LONDON,
November 15, 1924.

Yours truly,
JAMES TAYLOR.

"KERATOCONUS"

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—With reference to the abstract (on p. 545 of the last volume), "Diseases of Cornea: Wolz, Otto, on the question of the inheritability of keratoconus," the following may prove of interest. I quote from the memory of notes made in 1923, which are not available at the moment of writing this. Incidentally during an examination I found peculiarities in the nerve fibres of a young woman, which were suggestive of those often seen in cases of keratoconus. When I was examining her she chanced to say that some 30 years or more ago her mother had had operations on both eyes in Moorfields Hospital. I traced the notes on her mother in Moorfields Hospital. The operations were cauterizations for keratoconus, performed by Sir John Tweedy.

LONDON, W.
November 5, 1924.

Yours truly,
BASIL GRAVES.

MEDICAL TREATMENT OF CATARACT

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—I was very interested to read Mr. George Young's notes on Absorption of Cataract in the October (1924) Journal. I have seen a number of such cases and two particularly stand out distinctly in my mind.

(1) Mrs. K., aged 54 years, the wife of a Middlesbrough doctor, consulted me in July, 1920. I had seen her several times before about her glasses. She now said her sight was much worse. Her vision was reduced to 6/9ths (partly) and could not be improved. On careful examination with the ophthalmoscope her lenses showed quite well-marked striae coming in from the periphery, with scattered small opacities through the centre. I did not wish to give her cause for anxiety and expressed no opinion. I made some alteration in her spectacles and asked her to return and see me later. She came back in about twelve months and I found her lenses absolutely clear and with normal vision. I then said to her: "I was very concerned about you last time; I thought you were in for cataract; you are now quite well." She replied: "I thought in my own mind I was in for cataract." She expressed herself as being in much better health.

(2) Mrs. R., aged 50 years, residing at Redcar, Yorks. I have attended off and on for the past ten or twelve years for mild attacks of irido-choroiditis. About two years ago she had an attack more severe than usual. When I examined her I found there was much more exudation than usual into the vitreous. The

lenses were milky-looking, and there were very definite sectors of opacity running in from the periphery, as well as minute dark points towards the centre. I am sure I was not mistaking opacities in the vitreous for opacities in the lens. I gave rather a bad prognosis to her doctor, but hoped they would clear up, as I knew opacities in the lenses did clear away sometimes. I saw her 12 months later, and much to my surprise and pleasure her eyes to all appearances were quite well. She had had no treatment except atropin and the use of dark glasses. Certain remedies had been advised, but the patient always declined to take medicines. I have again seen her just recently, and she again has a mild attack of irido-choroiditis in the left eye.

I have once seen a mature senile cataract in a man of 76 years clear up entirely. This was in a patient I saw for over 20 years, and is one of those very exceptional cases we sometimes come across.

STOCKTON-ON-TEES,
November, 1924.

Yours faithfully,
G. VICTOR MILLER.

CLASSIFICATION OF DISEASES OF THE CHOROID

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

DEAR SIR,—Mr. Batten's criticism of my paper and defence of his own position appears to me to be mainly concerned with drawing distinctions between the clinician and the pathologist, a point which I have never made in my paper; indeed I think a less partial reader would have interpreted my meaning in exactly the opposite sense.

But in order to support his own view, he has fallen into the grave error, quite unintentionally I feel sure, of misquoting me in at least one place, while in others he has interpreted my remarks in such a way as to place me in a false position, and from this standpoint has attacked my general conclusions.

In the first place he pays me the high compliment of including me amongst the pathologists, a claim which I have never made for myself. I can only recall one very small contribution to the pathology of the eye that I have ever made and which is of not much importance, and it would be the height of bad taste to allude to the brilliant advances in pathological knowledge in the last 20 years, if I had had any hand in these advances myself; and yet Mr. Batten assumes that I have taken up this position.

Again he quotes me as stating that a classification of diseases of the choroid based on ophthalmoscopic examination is a relic of the past, and proceeds to accuse me of ingratitude, and leaves it to be assumed that I attach relatively little importance to the use of the ophthalmoscope. What I actually said was, that

"Classification . . . . based on the picture displayed to ophthalmoscopic examination—surely a relic of the past—etc.," which is a very different thing. The sentence he puts into my mouth is obviously absurd.

I am not sure that I quite understand Mr. Batten's criticism of my remark in reference to the retina, unless it is that differences in anatomical structure and physiological function in the same structure necessarily predisposes to a special vulnerability to specific organisms and toxins, a weakness with which I am quite familiar in regard to particular organs as a whole, but I am not aware that Mr. Batten has isolated any specific organism which attacks the macula as opposed to any other part, unless cerebral macular disease, comes into this category.

The brain shows variations in structure and function in its different parts, but the anatomist or neurologist could hardly be accused of ignorance for beginning a lecture with the statement that the interior of the skull is wholly occupied by the brain.

I am not an anthropologist but I can conceive of other methods of classification of the coloured races besides those mentioned by Mr. Batten, *e.g.*, according to the formation of the skull, etc., but after all we are not concerned here in making black people white or white people yellow; but we are engaged in treating diseases of the eye for which purpose we need the combined efforts of the clinician (medical and surgical), the pathologist and the bacteriologist, and I think Mr. Batten must admit that the foundation of all successful treatment is pathology and bacteriology. Now, with regard to the really important part of Mr. Batten's letter I do not question the two points he wishes to have conceded, nor that septic and cardio-vascular causes give rise to the ophthalmoscopic pictures which he has so ably illustrated, but they are not peculiar to the macula, and my contention is that diseases of the choroid should be studied separately from diseases of the retina in this situation as in any other part of the fundus, and, therefore, there is no justification for macular diseases being treated as a definite entity.

Yours faithfully,

MALCOLM L. HEPBURN.

LONDON. *December* 6, 1924.

NOTES

Prize

THE George Henry Marshall Prize in Ophthalmology, of the University of Birmingham, has been awarded to Dr. T. Harrison Butler. This Prize in Ophthalmology, of the value of £10, is awarded or expended from time to time in the form of grants towards

the expenses of research, the publication of original papers, the purchase of apparatus or books, or in such other way as the Medical Faculty may consider best, any instrument, book, or other object so purchased becoming the property of the University. Dr. Harrison Butler has forwarded the amount of the prize to the *Brit. Jl. of Ophthal.*, as a contribution to the expenses of publication of the Doyne Memorial Lecture.

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Appointments

CONTINO LUIGI PREZIOSI, B.Sc., M.D., D.O. (Oxon), has been appointed Professor of Ophthalmology in the University of Malta and Ophthalmic Surgeon to the Central Hospital.

LT.-COL. A. E. J. LISTER, I.M.S. (retired), has been appointed Surgeon to the Bristol Eye Dispensary.

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Royal London Ophthalmic Hospital Dinner

THE Annual Dinner of Past and Present Students of the Royal London Ophthalmic Hospital will be held at the Langham Hotel, Portland Place, W.1, on Thursday, February 12, 1925. Notices will be sent out in due course.

FUTURE ARRANGEMENTS

1925.

January 9.—Section of Ophthalmology, Royal Society of Medicine.

January 9.—North of England Ophthalmological Society at Bradford.

February 6.—North of England Ophthalmological Society, at Liverpool.

February 13.—Section of Ophthalmology, Royal Society of Medicine.

March 6.—North of England Ophthalmological Society, at Sheffield.

March 13.—Section of Ophthalmology, Royal Society of Medicine (Clinical).

May 8.—Section of Ophthalmology, Royal Society of Medicine.

May 11-14.—Congrès de la Société française d'Ophtalmologie, at Brussels.

June 12.—Section of Ophthalmology, Royal Society of Medicine (Annual).

July 14-17.—Convention of English-speaking Ophthalmological Societies, in London.